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ORGANIC SULPHUR REMOVAL

IN these columns last week, discussing in general terms the removal of organic sulphur compounds from town gas, we ended with specific reference to the development work sponsored by W. C. Holmes and Co. and described in the "JOURNAL" (issues of March 20 and 27, April 3 and 10) by Dr. Maxted and Dr. Priestley. The articles we have mentioned were subsequently, in response to request, published in booklet form. The number of copies was, of course, strictly limited, but a few are still available on application to the "JOURNAL" offices.

The plant has several interesting characteristics. It handles widely differing volumes of gases without difficulty and with equally effective results. At the large scale experimental plant at Otley Gas-Works the range was between 8,000 and 25,000 cu.ft. an hour. The cost of operation is by no means excessive and amounted at Otley to 0.24d. per therm or 1.17d. per 1,000 cu.ft. The process can be equally well applied to the purification of smaller quantities of gas on consumers' premises, when the cost appears to be of the order of 0.35 to 0.5d. per therm according to the number of hours worked per week. For a process of this character the dominating cost is likely to be that of labour. There have been good processes for the removal of sulphur in the past which have been uneconomic because of the cost of the attention required. This may be particularly high if the process is to be conducted on a comparatively small scale. The thiomolybdate plant has been so designed as to require no manual attention whatever, and to judge from Dr. Maxted's account has operated for many months without requiring anything more than casual and occasional attention.

An essential feature of most catalytic processes is the ability to revivify the expensive catalyst. The catalyst in this process appears to lose its activity only through deposition of carbon on the surface; revivification, by burning off this carbon, is necessary about once every one or two months. Arrangements have been made whereby a little of the catalyst can be withdrawn once a week, for example, or at longer or shorter intervals if desired, and replaced by a further supply of catalyst in good condition without disturbing the operation of the plant. The only reason why fresh catalyst is required from time to time appears to be physical disintegration of the matrix on which the catalyst is built up. The whole plant is arranged in a very ingenious manner with adequate heat regeneration through interchange between the cold incoming gas and the outgoing hot gas so that the amount of "live" heat required is not very large. In practice it is found that this heat is supplied chiefly by the combustion of the oxygen contained in the gas with a portion of the hydrogen in the gas to be purified. So long as there is present 0.8% of oxygen no external heat is required. Below this quantity of oxygen the incoming gas must be partly heated by the combustion of a little town gas. Above this quantity, the catalyst may require to be cooled by the introduction of varying amounts of cold gas; as the respective heating and cooling operations are arranged by ingenious instrumentation to be effective automatically the operation of the plant is quite simple. No positive information can be given upon the ability of the plant to deal with gum, but there is an indication that gum troubles are likely to be eliminated in gas which has been treated by this process. Further information upon this rather important matter is desirable.

INTRANSIGENT THIOPHEN

THE effect of the process upon the various constituents of organic sulphur is interesting. Observations suggest that carbon disulphide can be converted to H_2S by the thiomolybdate process more easily than any of the other constituents of organic sulphur. In practice, as ascertained by the degree of removal obtained from town gas, mercaptans can also be completely removed; on the other hand, other experimental results suggest that this almost complete removal is probably due to the small amount of mercaptans that are present in the gas, and it appears that ethyl mercaptan is by no means so easy to remove as carbon disulphide. Carbon oxysulphide is also removed quite easily though not to the same extent as carbon disulphide. The really intransigent substance is thiophen, which appears hardly to respond at all to this particular method of treatment. Observations published in the 6th Annual Report of the Gas Research Board indicate that a benzole extraction plant is particularly effective in removing thiophen from gases, that it is reasonably effective in removing mercaptans and carbon disulphide, though it is not effective in removing carbon oxysulphide. Obviously, the more wash oil that is used the better will these several bodies be extracted from the gas.

The conclusion would seem to be that to reduce the organic sulphur contents of town gas to a low degree the thiomolybdate process should be followed by a benzole extraction plant. This has been done at Otley and it has been found that in the normal operation of the plant the sulphur content of the gas is reduced in the thiomolybdate installation from the normal figure of 22-30 grains per 100 cu.ft. to some 8-11 grains. The subsequent operation of a benzole plant further reduces this figure to about 5 grains (the actual figures are between 3.4 and 6.9); thus the way seems clear for the adoption of an automatic catalytic plant followed by an automatic benzole plant whereby the sulphur content of the gas can be reduced to 5 grains per 100 cu.ft. with simultaneous recovery of benzole.

It is interesting to speculate whether a sequence of processes consisting of normal oxide purification, thiomolybdate catalysis, oxide catch box, and benzole washing is the most economic. There is evidence in Maxted and Priestley's series of articles that although crude gas cannot successfully be directly treated for the conversion of solid organic sulphur compounds to H_2S, gas that has first been subjected to a rough purification can be so treated. A crude gas containing 600 grains of H_2S per 100 cu.ft. gave rather high figures for unconverted sulphur compounds leaving the catalyst. A gas containing 50 grains of H_2S, however, gave results very little different from those obtained with purified gas. Experimental figures published by the Authors suggest that the cheapest procedure might be to pass the gas through a first rough purification (and this would be the least expensive type of oxide plant to operate) for the reduction of the H_2S to about 50 grains and then passed through a catalyst plant leaving the final purification to be conducted in oxide boxes in one stage. The reduction of the H_2S content of the gas to 50 grains might be effected by some form of (automatically operated) liquid purification and thus cheapen the process still farther.

The effect of thiomolybdate catalysis at 360°-400° C. on the composition of town gas is a matter of some consequence. Maxted and Priestley state that the oxygen in the gas combines with hydrogen on the catalyst. This means that the calorific value of the gas will be slightly increased although, of course, the thermal yield will be decreased. The decrease

in the thermal yield does not matter, since if the heat were not provided from this source it would have to be provided by direct combustion of additional gas. We would, finally, call attention to the work of Maxted and A. Marsden described in the Journal of the Society of Chemical Industry in February last. These Authors gave figures of typical analyses of the same gas before and after desulphurization, and concluded that no substantial change in the general composition of the gas occurs.

The process to which we have devoted this note must be considered as exceedingly promising, and we shall look forward to further information when it is available. The whole work is an example of first-rate collaboration between the University research worker and an industrial firm; and Messrs. W. C. Holmes and Co., Ltd., deserve the thanks of the Gas Industry for the development of this process.

RATING AND VALUATION

REPLYING to a question in the House of Commons last October, the Minister of Health stated that while the Government was aware that reforms were needed in the present system of rating and valuation, there was no early prospect of Parliamentary time being available for that purpose. In a message to the 64th Annual Conference of the Incorporated Association of Rating and Valuation Officers, which was held at the Central Hall, Westminster, on June 28 and 29, the Minister foreshadowed that "changes in law and administration may even affect the machinery of rating and valuation itself." Mr. Aneurin Bevan added that "the Annual Conference is an invaluable medium for an exchange of views and experience," and discussion which took place on this occasion ranged from points of detail in the making of local rates to the wider sphere of the place of valuation in the post-war world. The subject of the rating of public utilities was by no means neglected.

After dealing with matters of domestic and general interest, Mr. T. C. Penn, the President, referred to some judicial decisions during 1945 which raised important points of rating law—including the case of the Croydon Gas Company, in which the Court had held that a loan from the uninvested balances of various funds established for the benefit of its employees must be deemed to be provided as ordinary tenants' capital. The case of gas, water, and electric light undertakings was instanced by the next speaker in regard to the lack of uniformity in the existing valuation lists. Where these "special properties" were in areas heavily blitzed or compulsorily evacuated, the assessments had been reduced, whereas similar undertakings in other areas had had their assessments increased by reason of the concentration of population and factory production. The speaker suggested, therefore, that the next valuation list should come into operation on April 1, 1948—a year earlier than that recommended by the Association.

These references to the position of public utilities in all probability had an effect on the discussion which followed the presentation of the Paper submitted to the Conference by Captain H. W. J. Powell, on "Valuation for Rating of Utility Undertakings." In stating that the practical application of the "recognized formula of assessment," defined by Cave, L. J., in the well-known case of *Kingston Union Assessment Committee v. Metropolitan Water Board* (1926) produced some points on which valuers were inclined to differ in their opinion, there was little warning that the Author would, in reply to the discussion, agree so wholeheartedly with those speakers who criticized the method of rating prescribed for public utilities as a "cock-eyed system." Admittedly, the valuation of these extensive hereditaments produces difficulties and maybe from time to time, anomalies; but to castigate the principle of the "hypothetical tenant" as unsound appears to be very sweeping and requiring more evidence than was offered. It was, perhaps, unfortunate that the eminent rating surveyor probably most qualified to comment from practical experience of valuing many differently situated gas undertakings, first opened the discussion and did not in consequence have an opportunity of expressing any contrary view to this particular point.

This speaker had already contested the suggestion that the gross receipts of an undertaking can be increased for the purposes of local taxation in circumstances where the charges are below "competitive levels" (whatever that may precisely mean) and there is power to increase the price charged. The point was well made that to adjust the figure of gross receipts except for a prospective increase in charges to consumers or for known additional commitments as the date of the valuation, would be to assume that the owners of the undertaking did not know how to conduct their business. Support for this attitude was forthcoming from one who is also associated with a firm of rating surveyors well known in the public utility world. This is not, of course, to deny that the Author of the Paper is not well qualified to express views gained from close contact with the practical aspects of the subject, but we would not like it to go forth that the Gas Industry—while we cannot speak for the water and electricity supply industries, it is possible that their reaction may not be dissimilar—is in complete agreement with the view that public utilities are not bearing their fair share of the burden of local rates.

In the House of Lords case, Lord Cave particularly stressed that their Lordships' decision did not mean that in no instance could another method of valuation of a waterworks be adopted by a rating authority, but that special circumstances (which he did not find in the Metropolitan Water Board case) must exist in order to exclude the "revenue basis" which has generally worked fairly equitably for a century. While there may be much to be said for an overhaul of the existing machinery of rating and for a reconsideration of the application of certain aspects of the principle enunciated by the Courts for the valuation of public utilities, we venture to express the hope that the alternative will be debated from all angles before the present basis is displaced.

We are interested, therefore, to read that in his view the valuation should be based on the year's accounts available to the hypothetical tenant preceding the date of a proposal under Section 37 of the Rating and Valuation Act, 1925, for an amendment of the Valuation List. In the ensuing discussion, however, it was pointed out that the past year's accounts are no criterion of the rating valuation which is necessarily computed in advance of the making of the rate—as distinct from assessments to income-tax which are based on the profits of the preceding year. This distinction is not disputed, but it is necessary to bear in mind that in the event of potential variations in the gross receipts being taken into account, the valuation thus arrived at should not be increased during the quinquennial period on any pretext. In this connexion it is to to be noted Resolution 68 of the Representations made to the Minister of Health in July, 1931, by the Central Valuation Committee recommended that normally the *cumulo* net annual value and the general apportionment among the rating areas concerned should not be disturbed during this 5-year period. Yet it is not entirely unknown for a rating authority to view an extension of an undertaking as justifying a revision of the List. A more consistent attitude would appear to be called for in any general adoption of the idea that full effect is to be given to the trend of gross receipts.

The suggestion in Captain Powell's Paper that a higher percentage than 15 of the "Tenant's Capital" would probably be justified in the case of a gas undertaking is welcomed, and it is recalled that the Rating Authority's Surveyor expressed the view in the Bath Gas Company's appeal in 1929 that an allowance at the rate of 17½% allowed in the 80-year case of Rex v. Lee was amply justified. With the statement that the question of the *quantum* of "Tenant's Share" is one not of law but of fact—to be judged by the risk involved, there must also be general agreement. In the

discussion it was commented that the idea of a fixed rate for "tenant's share" arose from a ruling in a Southern Railway Co. case, taken under the Railways (Valuation for Rating) Act, 1930, which also introduces other factors not applicable to the "recognized formula of assessment" in respect of public utilities other than railways. The Rating Officer of a Lancashire (Stockport) County Borough considered, however, that even 15% was too high in view of the fact that gas undertakings are not now the speculative venture they once were and that the current rates of dividends and interest are less than when the "recognized formula" was evolved. It is on record that the Valuation Officer to the Metropolitan Borough of Battersea made a similar plea in an address to a branch of the Association last year. It would appear that increasing attention is being given to this suggestion by rating surveyors, and the Industry will, no doubt, be prepared to rebut it when opportunity offers.

On the problem of the allowance to be made for the renewal of the tenant's chattels and the keeping in repair of the landlord's hereditaments we are interested to note the comments of the "doyen of the rating world" (as he was described by the Author of the paper) that it must not be overlooked that the financial structure of public utility undertakings is, generally speaking, on a pre-war basis and the transition to complete renewal of gas-works plant must of necessity be only a gradual process. Nevertheless, the *quantum* of the allowance is a question which will, no doubt, continue to exercise the minds of both gas administrators and rating valuers for some years to come, and the expressions of opinion ventilated at the Conference afford a valuable guide as to the direction in which the latter are tending.

In conclusion we would refer to the discussion which took place on the percentage rate to be applied to an undertaking's sinking fund. Seeing that an allowance for wear and tear is given for income-tax purposes, it was urged that the gross charge should be applied and not the net rate of interest—*i.e.*, after deduction of tax. We are not so concerned with this particular aspect as with the statement made that the majority of gas undertakings are municipally-owned. Statistics show that this is incorrect, whether judged by number, make of gas, or capital involved. Does this mean, we are led to wonder, that rating officers are particularly anxious to secure that local authority undertakings shall be regarded as milch-cows? Our impression may be mistaken, but we should be sorry to see any action which would penalize a certain section of the Industry. Perhaps, therefore, it is pertinent to note that in replying to a vote of thanks Captain Powell remarked that nationalization of public utilities will provide the remedy for many differences of opinion on the rating of these "special properties." We deplore this attitude towards undertakings which, as was mentioned by one speaker, are operated primarily for service to the public. It has been computed that the Gas Industry contributes annually to the local exchequers some 2% of the total rates levied—a not inconsiderable amount.

While reiterating our recognition of the valuable functions of such conferences we cannot but deprecate any possibility of their being used—however unconsciously—for the dissemination of irresponsible or politically-biased statements.

Arthur Docking & Co., Ltd., having acquired a controlling interest in Radiant Heating, Ltd., the two companies have now been merged under the title of Radiant Heating, Ltd., with Mr. Arthur Docking as Chairman and Governing Director.

The B.B.C. is Broadcasting in the Forces Programme (short waves only) a series of cameos on different industries. These are intended to give troops in S.E.A.C. and the M.E. Forces an idea of the present Industry with a view to future jobs. Mr. E. G. Stewart (Group Engineer, Western Group, Gas Light and Coke Company) gave the first broadcast on June 27 and dealt with the gas-making side of the Industry. To-morrow (July 11), at 2.15 p.m., Mr. T. V. Garrud (Divisional Manager, Headquarters Division, Gas Light and Coke Company), will deal exclusively with the district.

Personal

Mr. DANIEL M. KERR, Manager of Kingskettle Gas Company, has been appointed Manager of Melrose Gas Company.

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Mr. W. H. G. ROACH, of Wm. Press & Son, received the M.B.E. in the King's Birthday Honours.

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Mr. D. L. COPP, Assistant Engineer-in-Charge of the East Greenwich Works of the South Metropolitan Gas Company, has been appointed Engineer of the Hornsey Gas Company, and took up his new duties on July 1.

* * *

Mr. L. G. BACON has been appointed to the position of Assistant Constructional Engineer to the Coventry Gas Department. Prior to his appointment he was engaged in a similar capacity with the Coventry Electricity Department.

* * *

Mr. L. T. MINCHIN, who has been on the staff of Watson House since its inception by the Gas Light and Coke Company in 1927, has resigned in order to devote his time to consulting work. He is specializing in gas appliance design and in street lighting.

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Mr. JAMES CARR, M.B.E., M.C., formerly of the Stretford and District Gas Board, who was appointed Engineer and Manager of the Bristol Gas Company last year, has been elected a Director of that Company.

* * *

Mr. D. R. KERNON, formerly Chief Engineer to the Chemical Engineering & Wilton's Patent Furnace Company, Ltd., has joined Sadler & Co., Ltd., Tar Distillers and Chemical Manufacturers, Middlesbrough, in the capacity of Chemical Engineer and Works Manager.

* * *

Mr. W. M. HALLIDAY has retired at the age of 70 after more than 53 years' service with the Newcastle and Gateshead Gas Company. He has been presented with a gift by the staff. Mr. Halliday is a Freeman of the City, and served with the Royal Northumberland Fusiliers in the 1914-18 war. He was Secretary of the Company's staff dinner club.

Letter to the Editor

High Pressure Gas Holders

DEAR SIR,—During the discussions on Mr. G. M. Gill's excellent Paper on High Pressure Gasholders, given at the 83rd Annual General Meeting of the Institution of Gas Engineers, Mr. S. M. Milbourne made the following statement:—

"There could not be any doubt that a riveted holder was the best and safest proposition."

I have had considerable practical experience with both riveted and welded high pressure vessels, and I state without hesitation that Mr. Milbourne is entirely wrong in his contention. I have still to find a high pressure riveted holder in this country which is absolutely tight under working conditions.

My Company designed a welded high pressure gasholder, 10 ft. diameter by 60 ft. 8¼ in. long, to A.S.M.E. Unfired Pressure Vessel Code, for a working pressure of 100 lb. per sq.in. This design was accepted by a British Insurance Company. On test, the vessel was subjected to the following test:—

Vessel filled with water, and pressure raised to 100 lb. per sq.in. At this pressure, all welded seams were hammered with a 7 lb. hammer. The pressure was then increased to 150 lb. per sq.in. by steps of 10 lb., and all seams hammered again *at each step*. No trace of leakage or loss of pressure was found.

This is an extremely severe test, giving a remarkable demonstration of what good elctric welding will withstand, and is analogous to the atom bomb test at Bikini, where the cleanest and only relatively untouched vessel in the fleet is a *welded* ship.

It will be appreciated that in a vessel storing gas at 100 lb. per sq.in., it is imperative that all seams must be absolutely tight. Should this not be so, and assuming that the aggregate leakages be equivalent to a hole ¼ in. diameter, the number of cu.ft. of gas lost per annum would amount to the colossal figure of over eight million, under a pressure of 100 lb. per sq.in. It is my considered opinion that only a correctly welded high pressure gasholder can be made absolutely tight.

I would not allow any of my men to flog with a hammer a riveted seam under a pressure of 150 lb. per sq.in. It is customary when testing a riveted vessel to release the pressure before any caulking is attempted.

Is Mr. Milbourne prepared to supply a *riveted* high pressure gasholder, and to guarantee that the vessel will withstand the tests applied to the welded high pressure gasholder described above?—Yours faithfully,

H. H. HOLLIS,
Chairman and Managing Director,
Oxley Engineering Company, Ltd.

Leeds. July 2, 1946.

Gas Research Board

The 5th Annual General Meeting of the Gas Research Board was held at 1, Grosvenor Place, London, S.W.1, on Tuesday, June 18, Dr. E. V. Evans, O.B.E., Chairman of Council, presiding.

The death, on Oct. 3, 1945, of the President of the Board (Sir David Milne-Watson, Bt., D.L., M.A., LL.D.), was reported, and it was unanimously resolved to invite the Rt. Hon. the Viscount Falmouth to undertake the office of President.

Mr. G. C. Pearson, O.B.E., and Mr. P. H. Wilson, O.B.E., were elected Vice-Presidents of the Board for the year 1946-47, to succeed the two retiring Vice-Presidents (Colonel C. M. Croft, D.L., J.P., and Lieut.-Colonel H. W. Woodall, C.I.E.).

The re-appointment for the three years 1946-49 was reported of the following members of Council, who retired on June 18 :

Appointed by the Institution of Gas Engineers: Mr. J. E. Davis, Dr. H. Hollings, Colonel W. M. Carr. *Appointed by the Society of British Gas Industries:* Mr. A. G. Grant, Mr. A. Forshaw.

Wood, Drew and Co., Chartered Accountants, were appointed Auditors to the Board for the year 1946-47.

The Chairman (Dr. E. V. Evans, O.B.E.) addressed the meeting. His comments were reported in last week's "JOURNAL," p. 24.

Director's Statement

The Director (Dr. J. G. King, O.B.E.) made the following statement of the work of the Board :

This meeting comes at the end of the seventh year of the existence of the Gas Research Board. Although established on a firm foundation, the Board has, by the conditions of war and its aftermath, been denied that growth in personnel and scope which it might have achieved in seven more normal years. The difficulty of obtaining good staff has been a serious hindrance to the enlargement of the field of work, but in my opinion, the chief obstacle has been the absence of adequate headquarters laboratories. We have tried hard to remedy this, and have perhaps been unlucky in failing so far.

In the meantime, the group working under the Joint Research Committee at the University of Leeds has remained active, and our thanks and appreciation are due to the Governors of the Imperial College of Science and Technology for the accommodation of staff at South Kensington in the Departments of Professor C. H. Lander and Professor Sir Alfred Egerton, and to these Professors for their sustained interest in the work of the Board. Our thanks are due also to the Director of the Imperial Institute for laboratory space in which to carry out analytical work.

In the work of the Board it will always be necessary to conduct research on the premises of gas undertakings, and elsewhere where facilities of the required nature are available. We are indebted to the Gas Light and Coke Company and to the South Metropolitan Gas Company for facilities in connexion with the survey of the combustion characteristics of coal gas, and the survey of organic sulphur compounds in town gas ; to the Directors of the South Metropolitan Gas Company in connexion with an investigation of corrosion in water heaters ; and to seven undertakings and firms of appliance manufacturers for facilities in connexion with a survey of methods of measurement of the radiant efficiency of gas fires.

New Water Gas Programme

The extension of the researches on hydrogenation and methane synthesis has been continued at Poole, and a new programme on water gas production is being added. In order to facilitate the work we are building a temporary laboratory there. We wish again to acknowledge our indebtedness to the Directors of the Bournemouth Gas and Water Company for the continuance of these facilities and for the help and advice of Mr. Moon (Resident Director) and Mr. Haynes (Engineer and Manager) and their staff.

I feel that we may regard as satisfactory the progress of the work during the year. Our present arrangement of holding the annual meeting of the Board before the end of the period which our annual report must cover does not permit of the presentation of a full and up-to-date technical report to the meeting. The annual report for the year ended June 30, 1945, was presented and discussed with other scientific papers at the 11th Autumn Research Meeting of the Institution of Gas Engineers in November, 1945. The same procedure may be followed this year. Your attention is particularly drawn to these annual reports of the Board, as they contain a complete statement of all the activities of the Council and its Committees and a fairly full account of the objectives of each research programme and its progress during the year.

Among the papers of scientific interest presented by members of the staff during the year, other than those appearing as Gas Research Board Communications, should be noted the Paper in the Waste Heat series of the Institute of Fuel, presented by the Director and the Joint Assistant Director, the Jubilee Lecture of the Society of Chemical Industry presented by the Director, a Paper on the catalytic synthesis of methane presented by Drs. Dent and Moignard, and a Paper on the separation and chemical utilization of coal gas constituents by Dr. Booth. The series of Information Circulars has been extended by two more on subjects of strong technical interest :

No. 2, GRB 22, The Underground Gasification of Coal.
No. 3, GRB 23, An Outline of the Theory, Types, and Applications of Combustion Turbines.

Close touch is kept, mainly through the Director, with other research departments working on fuel problems or on problems bearing upon those of the Board, and with Government Departments, particularly the Department of Scientific and Industrial Research and the Ministry of Fuel and Power, interested in our work. Through the Ministry, the Director and Drs. Dent, Booth, and Hall have been given the opportunity of inspecting certain establishments in Germany. The Director is also in correspondence with the chief fuel research establishments in the United States of America and the Dominions.

Staff Changes

Regarding staff, we have regretfully accepted the resignation of Dr. N. Booth, to whom we are indebted for the establishment and growth of certain programmes associated with the utilization of gas. We are fortunate, however, in acquiring the services of Dr. R. S. Strickland-Constable, who will control and initiate chemical researches of a fundamental character. We have also tried to find a physicist of outstanding ability to supervise, in the capacity of Joint Assistant Director, those programmes which are of a physical rather than a chemical nature. It is hoped that this appointment will be made soon. Four new appointments to the junior research staff have been made during the year, but three members have left. This is hardly a fulfilment of the hopes expressed at the beginning of the year ; the principal reasons are our insistence on a good standard, and the present severe competition for men of high ability.

Meeting of Council

At a Meeting of the Council of the Board, Dr. E. V. Evans, O.B.E., was re-elected Chairman of Council and Dr. H. Hollings was elected Deputy Chairman.

Coal and Coke Prices

Retail coal prices have been increased by amounts varying from a few pence per ton to 1s. 5d. per ton in consequence of the increase in railway rates. The increase in districts near the collieries will amount to a few pence per ton, whereas the increase of 1s. 5d. per ton will apply in the areas most remote from the coalfields in England, Wales and Scotland. In the London area the increase will be 1s. 3d. per ton.

In consequence of the increase in railway rates it has also been necessary to increase coke prices as follows :—

Gas Coke.—Area of the Northern Counties' Coke Association, 10d. per ton ; remainder of England and Wales, 10d. per ton ; Scotland, nil. In the area of the London and Counties Coke Association there will be a further increase of 10d. per ton on all coke sold in the area to balance the Coke Levy Fund. The area of the Association extends south of a line drawn from the Wash to the Severn, excepting the Isle of Wight and Cornwall.

Foundry Coke.—The price of foundry coke will be increased by 1s. 3d. per ton and other hard coke prices by 6d. to 3s. 3d. per ton, according to the area in which it is produced or sold. Such increases in the price of foundry and hard coke will apply to England, Wales and Scotland. All the increases took effect on July 8.

Diary

July 11.—Midland Counties Coke Association : Central Committee, King Edward House, Birmingham, 11.30 a.m.

July 11.—B.G.C. Northern District Meeting, 2 p.m., Gas Offices, Grainger Street, Newcastle.

July 15.—London and Counties Coke Association : Finance Committee, 11 a.m. ; Executive Committee, 11.30 a.m. ; Central Committee, 1.30 p.m., Gas Industry House.

July 16.—National Federation of Gas Coke Associations : National Technical Committee Meeting, 2.30 p.m., Gas Industry House.

July 16.—British Standards Institution Annual General Meeting, Institution of Mechanical Engineers, Storey's Gate, S.W.1. 3.30 p.m. Lord Woolton in the Chair.

July 17.—Solid Smokeless Fuels Federation : Technical Committee, 3 p.m., Gas Industry House.

July 17.—Industrial Gas Development Committee, Radiant House, Bristol, 10 a.m.

July 17.—Midland Association of Gas Engineers and Managers : President's Day : Visit to Worcester.

July 17.—B.G.C. Yorkshire District Meeting, 2.30 p.m., Civic Hall, Leeds.

July 18.—B.G.C. North Western District Meeting, 2.15 p.m., Gas Department Theatre, Manchester.

July 18.—Solid Smokeless Fuels Federation.—Executive Committee, 11.30 a.m., Dorchester Hotel, London, W.1.

July 19.—B.G.C. Midland District Meeting, 2.15 p.m., Grand Hotel, Birmingham.

International Gas Union

The first post-war meetings of the Council of the International Gas Union were held in London, at the invitation of the Institution of Gas Engineers, on June 5 and 6. The following organizations were represented:

America: American Gas Association, New York; Mr. Wilfred C. Philpot, General Superintendent of Manufacture, Consumers' Gas Company of Toronto.

Belgium: Association des Gaziers Belges, Brussels; Mr. V. Timmermans, President. Mr. R. H. Touwaide, General Secretary.

Canada: Canadian Gas Association, Toronto; Mr. W. C. Philpot.

Czechoslovakia: Czechoslovak Gas, Water and Sanitary Union, Prague; Dr. Tom Keclik, ing.

France: Mr. A. Baril, Past President of the International Gas Union. *Association Technique de l'Industrie du Gaz en France;* Mr. P. Germain, President. Mr. H. de Richemont, Director. *Gaz de France;* Mr. P. Mougin, official representative.

Great Britain: Institution of Gas Engineers, London; Colonel C. M. Croft, President. Dr. W. T. K. Braunholtz, Secretary. Mr. H. D. Greenwood, Controller (Gas) of the Fuel, Power and Public Utilities Branch of the Control Commission for Germany (British Element).

Netherlands: Vereeniging van Gasfabrikanten in Nederland; Prof. ir. G. A. Brender á Brandis, 's-Gravenhage.

Norway: Mr. John Irminger, General Manager, Gas Works, Bergen.

Sweden: Svenska Gasverksföreningen, Stockholm; Mr. C. W. Pilo, President.

Switzerland: Societe Suisse de l'Industrie du Gaz, et des Eaux, Zurich; Dr. Hs. Deringer, President. Lt.-Col. W. Leupold, Vice-President. Colonel H. Zollikofer, General Secretary of the International Gas Union, Zurich.

The first meeting of the Council on June 5, at Gas Industry House, was presided over by Mr. A. Baril, Past President of the International Gas Union At this meeting, Colonel C. M. Croft was unanimously elected President of the International Gas Union for the three years 1946-49. The second meeting was held at the May Fair Hotel on June 6, the President, Colonel C. M. Croft, in the chair. The statutes of Union were reviewed. Six Vice-Presidents were elected, representing the following gas organizations: American Gas Association, Association des Gaziers Belges, Association Technique de l'Industrie du Gaz en France, Vereening van Gasfabrikanten in Nederland, Svenska Gasverksforeningen, Czechoslovak Gas, Water and Sanitary Union.

It was decided that the headquarters of the Union should continue to be at Zurich (Switzerland); that Colonel H. Zollikofer (Zurich) should continue as General Secretary, and that Dr. Braunholtz should be the President's Secretary. Suggestions concerning the future activity of Union were proposed and discussed.

Cost of Nationalization

A stern warning about the cost of nationalization of the Gas Industry to Aberdeen was given by Treasurer Morrison at a meeting of the Aberdeen Town Council. The Corporation would get no compensation, he said. The Government would take over the whole gas undertaking, including £50,000 in cash, and, through a loss in income tax offset, there would be an increase in the rates of 3d. in the £.

By 15 votes to 11 the Council approved a recommendation by the Lord Provost's Committee to co-operate with the Ministry of Fuel and Power, if nationalization is effected, in implementing the Government's proposals.

"Is not the gas undertaking in Aberdeen under public control at the moment," asked Treasurer Morrison in challenging a remark by Councillor G. R. M'Intosh that nationalization was coming "whether they liked it or not."

Members of the Council had been elected to represent the interests of the ratepayers. Could they be said to be doing that if they supported the nationalization scheme? "I want to see our own gas undertaking kept under the control of the Corporation of Aberdeen," the Treasurer declared emphatically, and he protested strongly against the allegation made recently that local authorities in Scotland had not the ability to manage their gas undertakings—it was a scurrilous and unwarranted attack.

Councillor Reid suggested no further action apart from telling the Government to "go to blazes with their nationalization."

The Gas Committee Convenor, Councillor Brechin, seeking to justify support for nationalizing the Industry, said it was the only way to save the Industry as a whole in view of its importance to the country.

An Application by representatives of large commercial users for a reduction in the gas charges has been refused by Aberdeen Gas Committee. It was stated that on present costs such a reduction was impossible.

Birmingham and Nationalization

Nationalization of the Gas Industry was discussed at a meeting of the Birmingham City Council last week.

On the presentation of a report of the Gas Committee, Ald. Harold Roberts, M.P. for Handsworth, moved an amendment requesting the Committee "to consider the desirability of transmitting a copy of the report to the Minister of Fuel and Power with a strong recommendation that in the event of the nationalization of the Gas Industry, local authorities owning gas undertakings should be compensated on the same basis as companies, or individuals, owning such undertakings."

After a discussion the amendment was rejected by 62 votes to 56.

Councillor Burman, Chairman of the Committee, said the output during the year ended last March was the second highest ever achieved by the Department, but the prospects ahead in relation to coal supplies were not bright. Because of low outputs from the collieries the allocations of coal during the year had on the whole never been met and by the end of May coal stocks were equivalent to no more than one and a half week's winter consumption. To-day in midsummer the position was unchanged. If the coal situation did not improve materially at once, water gas plants would necessarily continue to be used as production units and there would be little coke available for sale.

Speaking of nationalization, he said the net capital expenditure to date on the undertaking was nearly £11,000,000.

Ald. Roberts, moving his amendment, said it might be assumed that when gas undertakings were nationalized fair and proper compensation would be paid. The Birmingham Gas Department had acquired assets by ploughing back profits and a conservative estimate of the worth of the undertaking was £10,500,000. He had heard it suggested that in the case of undertakings owned by local authorities the Government would take them over by merely assuming outstanding debts which in the case of Birmingham amounted to £2,500,000. If that was done it would be confiscation by the Government of assets belonging to the city worth £8,500,000.

Ald. Sir Ernest Canning, seconding the amendment, said Birmingham was entitled to the full value of the undertaking which had grown in a remarkable manner during the last twenty years.

Ald. Bradbeer urged that the amendment was premature as the plans of the Government were not known.

Ald. Byng Kenrick pointed out that it was merely asked that the ratepayers should be treated in the same way as any statutory company.

In the report, presented by the Gas Committee in pursuance of a resolution passed by the Council in January last, it is pointed out that Birmingham is the largest municipal undertaking in the world and the second largest gas undertaking in the United Kingdom. It has never been the policy of the Gas Committee to make large surplus profits, but to give to the consumer the best possible service consistent with an economic price for the gas supplied. From 1875 to 1933 the undertaking passed over surplus profits for the relief of rates to the extent of £2,003,157, but these contributions ceased in 1933 under the Birmingham Corporation Act of 1929 which precluded any further such payments.

The report summarizes the salient features of the undertaking:

(a) The works and carbonizing plant of the undertaking are in a first class state of maintenance and repair and its financial position is very satisfactory.

(b) Outstanding capital of £2,524,623 at Mar. 31, 1946, in no way represents the intrinsic value of the undertaking and capital expenditure to that date of £6,767,317, shown in the capital account, does not represent the full net capital expenditure incurred, which, without making any allowance for depreciation, may be more closely estimated at £10,964,703. In making this estimate no attempt has been made to adjust for the material upward trend of price levels which has taken place since the inception of the undertaking.

(c) While it has been the policy of the Gas Committee to maintain the price of gas at a low level, nevertheless past results, arrived at before charging income tax, show that all the capital employed is remunerative.

(d) The undertaking has an imposing record of steady growth, and in order to meet its statutory obligations it has become necessary to extend the carbonizing and ancillary plant with an additional capital outlay of £867,947 in accordance with a report of January last and a further £202,173 now proposed.

The accounts for the year to Mar. 31 last show a surplus on the year's trading of £286,707, which compares with the previous year's surplus of £34,120. The balance of net revenue account £286,707, is transferred to the appropriation account and allocation made to the reserve fund of £68,513 and to renewals and special expenditure account £200,000, leaving a balance of £18,194 in appropriation account.

The total expenditure on revenue account has advanced by £254,829, due mainly to the higher cost of coal and wages increases while the total income has advanced by £318,019.

The Question of Recruiting*

Why has the Gas Industry such difficulty in attracting the best type of young people? Advertisements of situations in all branches produce a poor selection of applicants. It is submitted that the required qualifications and experience are too finely specified and that the Industry would improve its personnel by selecting outsiders having a liberal education, intelligence, persistence, an enquiring mind, and a capacity for detail.

Colonel **C. M. Croft**: I am wondering whether the best way in which to answer this question is to ask another—namely, what does the Industry generally do towards recruiting?

In the experience of my Company, and in that of another very large London Company, there is no difficulty in attracting the right type of men, both on the technical side and on the working side or, shall we say, the wage-earning side. But we do take a great deal of trouble to let our men know that we have jobs for their sons. We also go out and about and inform the youth movements, the British Legion, old comrades' associations, the local Chamber of Commerce, and so on, and we do try to make our Industry one which belongs in interest, if not in investment, to the consumers.

At present, 60% of our senior positions are occupied by men whom we have ourselves trained. Further, even the British Gas Council has a Senior Officer who was a pupil at Wandsworth in his earlier days; one South Metropolitan undertaking was entirely manned, as regards administration and engineering, by ex-pupils of Wandsworth; we have another in India; and one man, who was not actually a pupil, but who spent most of his time with us, is now serving with a big Company on the south coast.

I think the answer is to let it be known everywhere that we have a job, and a good and continuous job, for men. If we select them rightly, and if they take the trouble to train, there are jobs for them which are worth having at the end of their training.

Training

Constantly we see in the technical journals advertisements for chemists, engineers, works managers, &c. Cannot we train our own? Must we always allow other companies to train men? If you treat your men well, the best of them will not be attracted elsewhere, unless to a very much more attractive job; only the second-class men will be attracted away to another undertaking. In every works, of every size, we must pay more attention to the training of the young men for the future. Generally, with regard to foremen and mechanics, within certain limitations the smaller the works in which they are originally trained the more general experience they get. It has been our habit during the last 25 years, if we mark a man down to become a foreman, to put him first into one of the smaller works and to bring him by degrees to the larger works. At the smaller works he has more complicated questions to deal with and has to act more quickly; and generally, I think, a man gains more experience where there are less facilities and plant, and the conditions teach him ingenuity and self-confidence. We want to train them, treat them well, and pay them well. Then, if necessary, at a later date exchange them; but exchange trained men, instead of advertising for another industry or company to provide you with men whom, to be quite frank, they may not have taken the opportunity to train.

Start with the Schools

Mr. **James Carr** (Bristol): If we are to attract the right type of person into the Industry we must start at the schools. Quite recently in Bristol I made it my business to write personally to each of the headmasters of every type of school, including the public schools, and to follow that up by a visit by a member of our staff to explain the opportunities for appointment to posts throughout every branch of the Industry. We must start at the age when the boys are leaving school. If we wait until two or three years after they have perhaps made a selection as to what they are going to do in the future, and ask them then to come into our Industry, we shall be too late. Unless we get right in on the ground floor we shall never attract the right type of person into the Industry.

I feel certain that the scheme which I have introduced in the Bristol area will bear fruit. I have had very responsive letters in reply to the communications I have sent out to the headmasters, and I am prepared to follow that up by arranging visits, by members of the staff and myself, in order to explain to the youths who decide to enter the Industry the possibilities for the future and the various types of work in which they can specialize.

Without such action I do not think we shall cut much ice.

* Being among the points raised and answered at the June Meeting of the Institution of Gas Engineers.

Offer of Scholarships

Mr. **Norman Hudson** (Mirfield, Yorks): I would like very definitely to support the remarks made by Mr. Carr. Even in a small undertaking we have found that to contact the schools is the best means of attracting personnel of the right type. We have gone so far as to offer scholarships and prizes that are worth winning in the local grammar school; we find that eventually the headmaster and his staff become conscious of the fact that there is a gas undertaking in the district which might offer an opening for one of their bright pupils.

One other matter I would mention is that of the difference between the pupils and the boys whose parents are probably not in a position to be able to make them pupils in a gas undertaking. I think we have to recognize that when we take boys direct from a grammar school, with possibly a School Certificate or even a Higher Certificate, we must be prepared to maintain them while they are learning in the Gas Industry. We cannot expect them to come for nothing. There may be a period in which they are of no use to us at all; but if we have the right boy and if we deal with him in the right way, we shall reap our reward for maintaining him during his period of learning by having a very useful professional man later on.

Mr. **J. H. C. Bates** (Brighton): I support entirely the views expressed by Mr. Carr and Mr. Hudson, because in Brighton we have gone into the youth business in quite a big way. It is my privilege to have been elected a lay member of the local Education Committee, and I have found that to be of extreme use in obtaining inside information, if I may so put it, on the activities of the various schools in the town, and also as a means of obtaining information of prospective candidates for the positions which our undertaking offers. We have a fairly comprehensive scheme for training lads; and we have an arrangement whereby, if they are of good type, we can transfer them at the age of, say, 18 years to a more advanced stage of activity—*i.e.*, from the craftsman stage to the more advanced professional status—to train under the Institution's scheme.

The Matter of Salaries

Mr. **R. R. Bate** (Birmingham): I feel that we should attract young men from the universities; they should join the carbonizing staffs and similar staffs in big works, being given a specific job of work to do, involving a certain amount of routine work, devoting, say, 50% of their time to that work, and the other 50% to the learning of new jobs.

I feel also that the salaries that have been offered to the young men are not sufficient to compete with the salaries offered in similar professions. At the moment I have in mind the salaries offered to teachers. As our President-Elect knows, we have had very great difficulty in attracting young men in Birmingham because of the competition of other industries. I feel we must press on with publicity, including inviting the members of technical associations and men from the universities around the works.

Colonel **W. Moncrieff Carr**, O.B.E., T.D. (Managing Director, United Kingdom Gas Corporation, Ltd.): As one responsible for a good many undertakings I have naturally been very much concerned with this vitally important question of recruitment of young technicians into our Industry. There is no question more important than that. So difficult did the position appear to be, particularly during the war period of shortage, that I was constrained, through my organization, to offer scholarships at Leeds University in order to attract suitable entrants. Those who have secured the scholarships have not been in any way committed to accept employment with the undertakings in the United Kingdom Gas Corporation, though we hope, naturally, that having secured the scholarships, the young men will be inclined to come to us. That is one way, and a way which I should like to see greatly extended.

There is a second way with which I am in entire agreement, and that is to contact the educational establishments in our respective areas. That has been dealt with already.

On the question of salaries, I would say that, on present values, a man who has taken, say, a university Degree cannot very well be expected to start at less than £300 a year. That is the basis I establish as a commencement, because there is post-Graduate training to be done. A man may have taken an Honours Degree, but he must devote at least a year or two years to practical work in gas engineering before he can take any real initiative in direction. Therefore, there is a limit to the amount that can be paid during the first year or two of post-Graduate training; but that training does fit the man to take a higher post at the end of that time.

I do feel that we should encourage more of our staffs and give them facilities to take a university training if they have shown aptitude in their preliminary training at the works.

Static High Pressure Gasholders

By R. G. MARSH,

Distribution Engineer, Birmingham Gas Department

THE area served by the Birmingham Gas Department is about 200 square miles in extent, throughout which low pressure mains have been laid in the usual way. The several works are situated practically in the centre of this area, and the gradual growth of the district has, as is so often the case, caused the demand to exceed the capacity of the low pressure mains to maintain the required pressures throughout the whole of the area, especially during peak hours.

About 30 years ago, compressing plant was installed at our largest works and a system of high pressure mains was laid to boost up the supply to the west, south-west, and south portions of the area, and governor houses were built at the extremities of the branches from the high pressure main system, and gas was fed through the governors into the local low pressure mains, in order to maintain standard pressures. In course of time, and due to still further demands for gas, certain extensions and additions were made to the high pressure main system, and pressures were still further increased in order to cope with the demand.

Increased Demand

We have now reached the position where, although pressures are raised to the maximum of the capacity of the existing plant, the demand is so great that the high pressure boosting system does not meet it satisfactorily at peak times. It became necessary, therefore, to consider what to do in order to meet these conditions. There were two alternatives—the first still further to increase the capacity of the compressing plant and raise pressures still higher; the second to introduce a system of high pressure storage, not at the works but at the extremity of the high pressure main system, by which the output of gas from the compressing station at the works could be augmented.

Of the two, the latter is preferred as it will avoid the scrapping of the compressing plant, which is still capable of many years of useful service and is easily able to deal with the normal loads throughout the week, only failing during the short periods of maximum consumption.

The high pressure distribution boosting system may be considered as assisting the supply to roughly 80 square miles of our area, and in this respect the new plant differs from the usual schemes where such holders have been installed in the past, in that it supplies a much larger proportion of our area instead of merely assisting the low pressure mains locally. The holder will be 25 ft. in diameter and 200 ft. long. This is the largest holder of its type so far to be erected in this country, and according to our information, probably the largest in the world.

Details of the Holder

The holder is being built for a maximum working pressure of 73 lb. per sq.in. and the volume of free gas discharged between the limits of 3 lb. and atmospheric pressure will be 467,500 cu.ft.

There will be two relief valves set to blow off at 81.5 lb. per sq.in. The cylindrical portion of the holder is being made up of 1 in. thick plates and the hemispherical ends of $\frac{5}{8}$ in. thick plates. The longitudinal seams of the cylindrical portion will have wide butt straps on the inside and narrow butt straps on the outside and will be treble riveted. The circumferential seams of the cylindrical portion will be of double riveted lap type, rivets in both longitudinal and circumferential seams being of $1\frac{1}{16}$ in. diameter. The radial and circumferential seams in the hemispherical ends will be of treble rivet lap type, the rivets being $\frac{7}{8}$ in. diameter. All rivet holes in the shell and end plates will be sub-drilled and subsequently reamered out to full size to ensure accuracy of fitting during erection on site. All the riveting on site will be carried out by hand.

The holder will be supported on 13 built-up mild steel cradles shaped to fit the outside of the cylindrical shell. These cradles have been designed to take their due portion of the weight of the shell in addition to the load to be imposed upon them during the hydraulic test. The twelve cradles are each fitted with 10 mild steel rollers which will be free to move in the longitudinal direction of the holder to provide for expansion and contraction. The remaining cradle, which is at the longitudinal centre of the holder, will form a fixed anchorage, expansion thus being allowed to take place towards each end. Thirteen sets of internal frames are being provided to prevent distortion of the shell when the holder is not under pressure, positioned over each cradle, thus transferring direct to the foundations any loads imposed on them.

The holder is being provided with six 18 in. diameter manholes, two 6 in. diameter cast steel valves for inlet and outlet connexions, and four cast steel valves for drainage. Two inside fixed ladders are being provided and a travelling ladder outside which will be capable of moving round the entire periphery of the holder.

After erection the holder will be tested hydraulically to 143 lb. per sq.in. Under these conditions the total weight of the holder and water will be 3,088 tons. A supply of water is available about a quarter of a mile away from a river and this will be pumped up through temporary pipelines to fill the holder and the final test will be by hand pump, the water being allowed to drain away back to the river through the same pipes after completion. The site of the holder is roughly 60 ft. above the level of the river.

The completed site ready for the reception of the holder, work on which is now being started.

Choice of Site

The site chosen for the holder is on a hillside and about 6,000 cu.yards of excavation has been necessary to level it out, so that at one end the top of the holder will be practically level with the original ground level, and at the other end the top of the holder will be 25 ft. above ground level. This excavation work has now been completed, including the construction of concrete retaining walls at the end and side of the excavation, and the provision of 13 concrete bases. The sub-soil has been found to be of excellent quality and easily able to withstand the load to be imposed upon it through the concrete bases during the period of the test. The concrete bases measure 18 ft. by 4 ft. and project about 2 ft. above the ground and are spread out to 19 ft. by 5 ft. at the lowest portion underground.

Our photograph shows the completed site ready for the reception of the holder, work on which is now being started. The area of the site is such that three more holders of the same size may be installed later if required.

Compressor House

The high pressure main has been extended from its present termination to the site, and a suitable building is being erected to accommodate an electrically driven compressor. The compressor house is being divided by a partition wall into two halves. On one side all the electrical gear will be installed, and the compressor on the other driven by an extension of the motor shaft through gas-tight bearings in the partition wall. The compressor will be capable of delivering 16,000 cu.ft. per hour up to a pressure of 80 lb. per sq.in. driven by a 59 B.H.P. motor, speed being variable up to 480 r.p.m.

The compressor is of the two crank, two stage, double acting, vertical type fitted throughout with forced lubrication. The cylinders will be water-cooled and the cooling water will be dealt with by a Heenan and Froude water cooler. Provision is made in the house for a further compressor.

A high outlet pressure governor will control the supply from the holder when it is discharging gas back into the high pressure main system. The actual filling of the holder will take place during the ample time available in the week between peak load periods. The plant will be under constant attendance during the periods of both filling and discharging. Although suitable arrangements can easily be made to make it fully automatic, it is not considered desirable to do this with a plant of this size.

Telephone communication with loud speakers is being installed between the compressor house and the nearest governor house on the high pressure system and, of course, suitable gauges and recording apparatus.

Gas Charges at Blackpool are being increased from 10½d. to 11.8d. per therm. The reason given by the Gas Committee is that wages and fuel costs have increased considerably. Even so, the new price is much below those of many authorities.

Waverley Association Discusses Nationalization

THE Waverley Association of Gas Managers is unique among the senior Associations in the fact that the Presidential Address is open to discussion. We published last week the Address which Mr. H. Robinson, Engineer and Manager of the Annan Gas Company, presented at the annual meeting on June 21, and we now report the discussion which ensued.

Mr. **R. Cowie** (Hawick) congratulated the President on his courage in surveying the Heyworth Report at a meeting of that kind where a discussion would follow his remarks. Any such discussion, in a democracy like theirs, could do nothing but good. He was interested in the sulphur question and agreed that space heating had a great future if they could keep the sulphur out and get rid of the smell. He thought the smell was due to the sulphur compound and when the sulphur went the smell went also. They had been very fortunate in Scotland and with some Lothian coals it was not difficult with good purifying plant to get down to the three or four grains mentioned in the Paper.

Mr. **R. Keillor** (Greenock) said the Address was on statesmanlike lines. A great deal of it had been devoted to nationalization. For years many of them had been strenuously seeking Government recognition and now the Government had thought fit to give their Industry a very high place in the order of merit by choosing it as the second industry to come under nationalization. It was a blessing mixed with responsibilty. The blessing would come through their greater contact with the coal and coke industry and the responsibilities would come through their having to attain a high level of practice to enable them to keep in step with the anticipated demands for gas. If these worked out as expected the estimates of the Heyworth Report would look foolish.

The cost of production, said Mr. Keillor, should determine the basic price of gas and in the future they had to work more and more towards making the provision and servicing of gas appliances a separate item of cost. The price of gas should not be loaded with all these extraneous costs. That was the only way to make gas a popular fuel.

Minister Surprised

Mr. **James Dickson** (Dundee) said the President had expressed his views on the Heyworth Report and nationalization in a forthright manner. He had given, nevertheless, a balanced opinion and had written with a sense of responsibility. He was to be commended for reviewing issues that might arise and for raising the question as to whether further extension of administrative control by the Government might have attained the same ends as transfer of ownership. He could remember when the Gas Industry asked to be less trammelled by legislation. Now they were to get more of it than ever before, with advantage, he hoped, to the Industry. Vital information applicable to the uses of fuels with their respective efficiencies had been to a very great extent unknown to the public and, indeed, to the Government. The scale and complexity of the administrative and technical problems of nationalization appeared to have surprised Ministers. Attention had been focussed on fundamental principles and little attention had been paid to the extremely difficult technical problems of nationalization. Limitations and shortcomings in the field of preparation were now being realized seriously. Little guidance had been available on detail and improvization had had to be resorted to in order to fit in with existing circumstances. As gas engineers, in the larger future opening out of the Industry, they could put into effect the closing words of the Past President of the Institution in his Presidential Address on June 4: "I should like to emphasize that it is a matter of urgent necessity for the Industry to continue and indeed intensify its developments both regarding technical achievements and social welfare to the highest possible degree. Whatever the circumstances it always has been and will forever remain the duty of an engineer to give of his best in the public service."

Need for Regional Survey

Mr. Dickson asked if regional areas could be drawn on a map with any sense of future usefulness before detailed investigation was carried out regarding the economic limits of bulk distribution in such areas. Only after that had been most carefully carried out could reasonably efficient manufacturing stations be linked up to provide area supplies on sound lines, especially having regard to the costs of compression, transmission and the writing off of plant erected within quite recent years. The rising costs of mainlaying, especially, were deserving of notice. What again was the basis for fair compensation having regard to Statutory company and municipal interests, the latter having roughly half the output of the former. The assumptions in the Heyworth Report on the terms attaching to capital set out various estimates of cost of acquisition and interest rates which the Regional Boards might have to carry. These assumptions, in their very differences, raised acute divergences of view in the minds of Gas Committee men and the Directors of companies. The Heyworth Committee, in their summary of recommendations, said that it was outside their province to indicate a basis of purchase, but they advised the compulsory purchase of all existing undertakings. They suggested that independent machinery should be set up to determine a basis of fair compensation. Might this not be ultimately determined on the principle of the maintainable profit multiplied by x years, due regard being paid to the state of the existing works and the capacity of the plant for meeting the present demand and spare plant for meeting additional demand?

The Government might claim that in the case of municipal undertakings particularly they would be accepting future liability by obtaining their assets and if the undertakings were taken over on the basis of compensation in excess of the outstanding debt they would be requiring gas consumers to pay for the second time for the redemption of the same assets through Regional Board charges.

One of the chief tests of the compensation paid to local authorities for their gas undertakings would be whether such compensation was directed to the benefit of the Gas Industry or the gas consumer. If not, then the future burdens on the Industry and the gas consumer would be greater, while the benefits would be derived by the ratepayer.

Divided Interests

Complete and wholehearted co-operation between undertakings could produce schemes which were economically sound, having regard to the present and potential demands of the district, *i.e.*, in the reduction of manufacturing units and the distribution of ample supplies of gas of steady quality and at a reasonably low price over limited areas, while leaving the managers of the works that were overtaxed to devote their energies to distribution and sales. But such co-operation had not been brought into the light of practical operations through divided interests. That was largely why measures for nationalizing the Industry had been fomented.

Mr. **W. C. Campbell** (Galashiels) said he was interested to hear Mr. Keillor say the Industry should be honoured at being taken over by the Government. He understood that Mr. Herbert Morrison had declared that it was the inefficient industries that were to be so taken over. If the Government lived long enough they would get nationalization and the life of the Government would depend on the length of the queues outside the shops. After the 1914-18 war the introduction of the vertical retort helped their Industry to overcome the difficulties of disposing of their residual products. At the moment they had nothing new to bring into operation and it might be that nationalization would be necessary if they were to continue to give good and proper fuel service to the public. In any event, they would still have to face competition.

Mr. **G. C. Pearson,** O.B.E. (President of the Institution of Gas Engineers), said that the opposition to nationalization was largely a matter of compensation and that was a difficult matter. With regard to the extraction of sulphur compound they had an easier problem in Scotland than in the South. It was essential to have a benzole plant. Gas sent out for industrial purposes did not need to be purified of sulphur at all. He had every sympathy with those who thought that gas should be kept as clean as possible. If they got the coal they could meet the increased demand, but otherwise they would be in a difficult position.

Still to be Proved

Mr. **D. Fulton** (Helensburgh) said it was still to be proved that the principle of nationalization was sound. So far, their experiments in nationalization had been confined to monopolies like the Post Office and the telephone service. They could not say that these services would not have been as successful under private ownership. They should view the question of gas and electricity from a detached point of view. They were domestic commodities and had not complex problems attached to them like iron and steel with their export difficulties. Following the last war, when reorganization, then as now, was the order of the day, the Gas Industry missed a golden opportunity by not asking for the recognition and support accorded to electricity. He was convinced that had they arranged in 1920 for the setting up of a Gas Commission similar to the Electricity Commission progress in the last 25 years would have been much greater. Their Industry, all through, had been cursed with a parochial outlook. Too many desired to see it not as an Industry but as X, Y or Z undertakings. It was only recently they had been bringing about some integration, though not enough. If they had had the Commission 25 years ago pressure would have been brought to bear on some of their small and inefficient undertakings to the advantage of the Industry and the consumer. Like Mr. Cowie, he commended the President's courage. If the Industry were left to itself it could reorganize itself, but history was against it. They had had the opportunity but had not taken it. Whatever progress they might make would be too slow. Without redirection in the Industry they would be unable to meet the competition of electricity. They were not

meeting it at present, nor were they making the progress they should be making.

The President has stated that the Heyworth Report was produced by five business men. Nevertheless the hand of the Civil Servant was there. With regard to dividing Scotland into areas it was not a matter of the interests of the industrial West versus those of the East. It was a question to be decided by geographical considerations and by the question of whether Scotland as a unit would be too unwieldy. Scotland was receiving careful treatment from the Coal Supplies Officer and they had much less reason to complain of the quality of coals and the attention they were receiving than their rival electricity.

Mr. **A. C. Rea** (Bath) said they should not be complacent about the coal situation. They were coming to a point where the plant designed pre-war for better quality coal was having difficulty in dealing with the present supplies. Producers could not operate efficiently with coals having a high ash content. They had to keep on driving for an improvement in quality. So far as nationalization was concerned, each of them was bound to think of it as it affected himself. There was ample room for improvement in the Gas Industry and any undertakings within reach of a large one could probably be greatly improved. They should look at the question not from a narrow angle but from a national point of view.

Mr. **Robinson** briefly replied and thanked those who had spoken for their observations.

The Gas Industry in Belgium, 1939-1945*

By M. BRABANT

Vice-President, Belgian Association of Gas Engineers

IN a symposium, entitled "The Gas Industry Overseas," published in 1939 by the Institution of Gas Engineers to commemorate the death of William Murdoch, founder of the Gas Industry in Great Britain, our Association reviewed the origin of the Gas Industry in Belgium, and its development in the course of time, as well as tendencies marking its evolution. The war broke out a few months after that communication was published; and, for years since, war circumstances imposed upon gas undertakings an existence which did not hold out anv of the bright expectations at that time entertained.

Effect of German Invasion

In May, 1940, following the sudden German assault upon our country, either complete devastation or severe damage was inflicted upon our gas producing plants (coke oven installations and gas-works), and particularly upon our gas distributing system. Quite a number of our low- and high-pressure steel or cast-iron mains were utterly ruined for long stretches either by air-raids or artillery fire, or by demolition of bridges supporting the gas mains. One of the earlier precautionary measures taken by Belgian authorities at the time of the invasion was to put out of commission all waterless gasholders, to take stock of all available coal, and, by means of interconnexions already provided in peace time, to ensure the possibility of assistance, whenever necessary, to any district where gas production had stopped. As the invasion of our territory progressed, such interconnexions helped greatly. Notwithstanding the destruction of gasholders and gas producing plants, oven temperatures were successfully maintained at such a level as would save the ovens from complete degradation through sudden cooling of their structure. In Belgium, most of the distributed gas is supplied by coke oven plants. It is well known that the temperature of these ovens cannot fall below 1,100° to 1,400° F. without the risk of structural deterioration in the chambers or flues as a result of changes in the silica constituents. The interconnexions also successfully ensured adequate, though curtailed, gas distribution, with a view to meeting the essential needs of the population. Belgium having been occupied and the campaign having come to an end, gas undertakings endeavoured to repair every section of the gas mains which had been broken or damaged, as well as all gas producing plants that had suffered injury. Less than two months were required to complete the most essential repair work. At gas-works, however, coal supplies were exhausted, and operations proceeded without knowledge of what the next day would bring.

This ominous situation improved but slowly, mostly on account of inadequate transport facilities. A considerable amount of our rolling stock had actually been evacuated to France, or had been ruined beyond repair; while part of our railway and waterway systems had become useless because of destruction by the Corps of Engineers or in battle.

In this connexion, and, by way of illustration, there is listed below the tonnage of coal carbonized in coke oven plants and gas-works from 1938 to 1945. The 1938 and 1939 figures are given for comparison :—

Year	Coal Carbonized (Tons) Coke Oven Plants	Gas-works
1	2	3
1938	6,693,910	50,884
1939	7,382,370	50,425
1940	5,211,650	36,378
1941	5,790,840	53,289
1942	5,791,620	71,506
1943	5,832,830	103,703
1944	2,709,280	74,512
1945	2,939,000*	100,177

* January, 124,103 tons; December, 347,666 tons.

* From "The Gas Industry Overseas: 1939-45". Communication No. 299 of the Institution of Gas Engineers.

From June, 1940, to date, the notorious insufficiency of coal allocations to the Gas Industry prevented the meeting of normal demands. During the occupation, the German "Energy" Department repeatedly urged that gas consumption should be limited to a given volume calculated on a basic consumption, above which a fine, preceding disconnexion, would be imposed. Belgian gas engineers steadily opposed such regulations. It was obvious that this measure was intended to allow the "occupant" to obtain for his own countrymen and services established in Belgium, or working for him, all the gas they wanted. The main pretext, which was given to the Germans in order to thwart their intentions, was that the gas as supplied by the Belgian coke oven plants was a secondary product, the supply of which depended on the production of the main product, coke and synthetic ammonia. Since production of the latter was inevitably chaotic because of irregular coal supplies, poor stocks, the need to avoid charging ovens by night on account of the black-out, frequent stoppages in plant operation, the supply of gas for distribution was liable to even sharper fluctuations than the variation of synthetic products, considering the lesser importance of gas production.

Since the system of interconnecting coke oven plants extends in Belgium through large high-pressure transmission mains, to which the distributors' mains are connected, it inevitably follows that variations in gas supplies are not only a daily occurrence and of a character that cannot be foreseen, but that they also affect considerable portions of the national territory. These and subsidiary reasons counteracted the designs of the occupying authorities; if gas distribution were limited to certain periods (peak consumption periods) corresponding with meal hours, and if it occurred according to production possibilities, it did not assist, by way of priority, in meeting the enemy's needs.

Allocations of Gas

One of the vital uses to which gas was put was the fuelling of motor vehicles. The scanty volume of petrol which was supplied to us was a constant threat to the transportation of foodstuffs and other materials essential to the subsistence of the population. These conditions were responsible for the building of a number of compressed-gas stations where vehicles refuelled with gas at 4,000 lb. per sq.in. pressure.

From 1942 to 1945, gas was distributed in Belgium as follows :—

TABLE 1

Year	Ordinary Consumers (Thou. cu. ft.)	Industry, Preferential Tariffs, Public Utility Services Own Consumption (Thou. cu. ft.)	Gas for Motor Vehicles (Town Gas and Residual Syntheis Gas) (Thou. cu. ft. at 475 B.Th.U.)	Total (Including Losses) (Thou. cu. ft.)
1	2	3	4	5
1942	13,364,404	8,749,740	1,948,207	24,062,351
1943	14,366,253	8,638,228	3,200,016	26,204,497
1944	7,509,016	4,189,157	2,871,655	14,569,828
1945*	9,072,594	5,181,616	1,509,357	15,763,567

* Provisional figures.

In addition to coal shortage, our production, transport and distribution departments suffered more and more from an ever increasing deficiency in supplies of oil, grease, leather, rubber, pitch, tin, lead, copper, ferrous metals, &c.

Confronted with mounting difficulties and eventually with the impossibility of obtaining these materials, which were distributed by the "occupant" through the channel of official organizations, operating under German control, the Belgian Gas Industry had to fend for itself. It was because of stocks saved from German requisition, as well as hidden supplies, that both gas producing and distributing departments managed to weather as best they could vicissitudes of every description and eventually to emerge from the occupation without having sustained irretrievable losses.

Our gas managers had a hard fight defending their personnel against forced labour in Germany; they set about it very energetically and succeeded in keeping nearly all hands from deportation.

Liberation Problems

In 1944, during air-raids that preceded our liberation, and as the Allied troops progressed in Belgian territory, every means of communication, by water or by rail, suffered heavily at the hands of Allied airborne troops and resistance groups. Gas-works, gasholders, and parts of our distribution system, were hit. Generally speaking, it can be said, however, that stoppages in gas transmission by air-raids never lasted for more than a few hours. Moreover, the Belgian Gas Industry has not suffered exceptionally heavy damage. It may be summed up as follows :—

Six gas-works have been damaged by bombing and their carbonizing plants have been either completely or partially ruined. Two of them have already resumed production; another was connected with the high-pressure distribution system; the three remaining works cannot possibly be put into operation yet.*

Gasholders, which as such are particularly vulnerable to bombing, were hit at numerous points, and we had to record complete destruction of 15 holders (one of 53,000, one of 176,500, two of 211,860, one of 247,000, four of 353,000, two of 494,200, one of 706,000, one of 1,059,000, and two of 1,235,500 cu.ft.). These are rapidly being rebuilt and it can reasonably be expected that the storage deficiency caused by their loss will have been made good by the end of 1946. Apart from these completely disrupted gasholders, 20 more have been damaged more or less severely, but were able, however, to be placed in commission again after the liberation of Belgium.

Some of the compressing and purifying plants were ruined; yet most of them have been put into operation again. Very extensive damage was done to the distribution systems, and some of these (among which were the St-Ghislain and Meirelbeke (Ghent) systems) have been totally destroyed. In the Antwerp and Liège areas, flying bombs badly damaged the mains and services. The full extent of the loss sustained by Belgian gas undertakings is estimated at more than 130 million Belgian francs (£742,857 at par), 1938 value.

It is known that the number of gas-works operated in Belgium had already been reduced before the war; there were 16 in 1940. As stated above, three gas-works suffered such extensive damage that their reconditioning has not yet been completed. On the other hand, four gas-works that were closed down in 1940 have resumed operations, so that there are to-day 17 gas-works actually in operation with a daily output of 4.9 million cu.ft.

Position in Coke Oven Plants To-day

Fifteen coke oven plants combined in 1940 to feed the high-pressure distributing systems, and in 1939 supplied the transportation and distribution undertakings with about 19,421 million cu.ft. of gas. All these coke oven plants, except one that has been closed down, are now in operation. Only one of them has suffered severe damage; it was, however, repaired after the Liberation.

It is obvious that, consequent upon air-raids and operations which led to the liberation of Belgian territory, difficulties in supplying the works with coal rapidly increased and eventually became insuperable. Moreover, output at the mines rapidly decreased, partly owing to the withdrawal of Allied prisoners compelled by the Germans to work as miners, and partly to the pitifully weak condition of the Belgian coal miners at the time of our liberation, through shortage of food, and poor clothing. It followed that coal supplies to all coke oven plants and gas-works suddenly fell to a figure below 60,000 metric tons per month, which can hardly suffice to keep the batteries in standing order. Only gradually, and consequent upon constant improvement in the standard of living of the Belgian miners, coupled with the arrival of German prisoners and imports of coal from the Ruhr and America, was it possible for coal supplies to be increased to reach, as from January, 1945, the following levels :—

Month	Supplies in 1945 (Tons) Gas-works*	Coke Oven Plants†
January	5,966	124,103
February... ...	5,113	118,523
March	8,624	171,267
April	7,566	183,958
May	5,255	173,667
June	7,871	236,943
July	8,761	263,681
August	8,365	264,686
September ...	8,658	279,706
October	12,898	362,158
November ...	11,828	412,645
December ...	9,272	347,666
Totals ...	100,177	2,939,003

* Coal Carbonized, excluding auxiliary consumption (boilers).
† Including coal for boilers.

* The Forest water gas plant was, however, placed in commission again at the end of 1945.

Throughout this difficult period, the Belgian Ministry of Economic Affairs had to take energetic measures in order to have the manufactured gas reserved for essential national needs. A decree, dated Nov. 16, 1944, had listed those needs on a priority scale, as follows :—(1) Compressed gas fuelling stations, (2) bakers' shops, (3) hospital and medical wards, (4) medical supplies works, (5) bacteriological and pharmaceutical analyses.

These measures naturally required the following regulations :—

(a) No increase in existing meters and no installation of new services.
(b) No more preferential tariffs for gas for domestic heating.
(c) No fresh installation of gas appliances.
(d) No more gas suction apparatus to be used, except for exceptional needs as outlined above, and provided that the booster did not interfere with the general distribution system (*i.e.*, caused no drop in pressure).

By the beginning of March, 1946, with the increased amount of coal being carbonized and the milder temperature, gas production satisfied nearly 80 per cent. of present needs, although the supply is about 31 per cent. above the corresponding pre-war level.

Lessons Learned from War

Something may be learned from the difficulties which confronted gas undertakings during hostilities. We shall not waste time in developing these in detail, as the author is convinced that mentioning them will prove sufficient to demonstrate their relevance. Experience has shown, amongst other things, that :—

(1) Coke ovens can be operated under widely differing conditions. Some batteries were for years operated very irregularly in that they passed, within a few days, from one charging system to another; while discharge was of necessity most of the time carried out in daylight. Generally speaking, ovens proved under the circumstances to be more resistent and flexible than could have been expected.
(2) The calorific value of the gas distributed could, without damage, be lowered to 425 B.Th.U. by admixture of water gas or producer gas, without requiring special regulation of household appliances. Such lowering of the calorific values enables, with an equal tonnage of coal carbonized, to supply to the distribution system a larger volume of gas and to maintain a higher pressure.
(3) Shortage of coal supplies allocated to the producing plants often resulted (because of shortage of gas supplies which followed) in reducing the pressure in the distribution system, and in creating a suction for varying periods. This method of operation, which would have filled our pre-war gas engineers with terror, did not prove disastrous. Generally speaking, it led only to the flattening of some meters when the suction reached 1.2 to 1.6 in. Explosives were few and were confined to meters.
(4) Gas used as motive power on vehicles proved a perfect fuel; yet it is not likely to be retained except for lorries on "door to door" service (*e.g.*, collection of household refuse, house delivery of goods), or for omnibuses running over short distances. To accomplish this, however, gas of high calorific value (675 to 900 B.Th.U.), of which 160 cu.ft. are equivalent to 1 gall. of petrol, would be required. Belgium holds out no chance of success for gas of lower calorific value.

What of the Future?

The Belgian Gas Industry is confronted with serious production problems. On the one hand, some coke oven batteries, too hardly used during the war, are to be discarded prematurely; most of these now being operated under conditions that impair their efficiency. These batteries must either be repaired, or reconstructed, or replaced as means of production by plant of a different type designed for new methods such as complete and continuous gasification.

Which way will the Belgian Gas Industry choose to follow? A reply would be premature, inasmuch as gas engineers have not so far formed an opinion as to the best way to go. If it be true to say that most of the technical problems have been solved by high-pressure distillation by the Winkler, Lurgi, or other process, there is much work still to be accomplished before we approach economically perfect solutions. One of our leading coke oven concerns is showing particular interest in the Winkler process, but has not yet succeeded in having the appropriate gas producer built.

Be that as it may, much interest is displayed by Belgian gas engineers in these modern methods. It cannot be forgotten, however, that coke remains the basis of the Belgian steel industry; gas engineers in this country, therefore, contemplate building new coke oven batteries to replace those doomed to be scrapped because of their obsolescence. One thing appears to be settled: all new oven plants will be of the "compound system," which permits firing either with rich gas or with producer gas, according to the coke or gas needs at the time. In pursuance of this policy, three coke oven plants will be equipped with gas producers capable of a daily gas output of 176.5 million cu.ft.; some of these producers are already under construction.

Gas Undertakings' Results

Bideford Gas and Coke Company.—Dividends for the year ended Mar. 31 at the rate of 13% on Original shares and 10% on Additional shares, less tax, were declared at the annual meeting on May 28. Gas sales for the year totalled 241,151,300 cu.ft. and brought in £54,730. The balance carried to profit and loss account was £7,415, and the carry-forward is £2,785, against £2,935 brought in.

Darwen Gas Department.—The accounts for the year ended Mar. 31 show that an exceptionally successful year's working yielded a gross profit of £20,470 and a net profit of £15,138, a record in the history of the undertaking. Since 1939 the price of coal has increased by 88% and the total cost of coal, including handling, has increased from £13,798 to £47,693 in the past year. Gas sold during the year reached a new record of 319 million cu.ft., compared with 290 million last year and 190 million in 1939-40. The amount of gas sold represents an increase of 68% compared with the year 1939-40. The total income from gas sales was £62,341, compared with £52,527 last year. The number of orders received for gas cookers and other appliances was much greater than in any previous year, and owing to the restricted supply it was impossible to meet all requirements. The total value of appliances sold during the year was £11,720, compared with £7,301 last year. Income for the sale of tar, coke, benzole and ammonia liquor was £39,652, against £25,694. Coke sold was 8,853 tons, compared with 4,234 tons in 1939-40 and 6,543 tons last year.

Holyhead and North Wales Gas and Water Corporation.—A reduction in gas sales due to the closing down of war service establishments was reported at the 50th annual meeting on June 22. Total sales in the year ended Mar. 31 were 174,552,400 cu.ft., yielding £55,789, compared with 186,959,200 cu.ft. (£57,628) for the previous year. The balance of net profit, however, was £10,476, against £10,118. A dividend of 6%, less tax, has been declared, and £1,000 has been transferred to reserve fund account, leaving a balance of £9,903 to be carried forward, compared with £8,110 brought in.

Nottingham Gas Department.—Because of the shortage of other fuels the consumption of gas at Nottingham during the year was a record. The output of 100,807,000 cu.ft. for the week ended Mar. 10 was also a record. It has been found necessary to purchase gas from two adjacent gas undertakings to meet the increased demand, rather than to reduce pressure as was found necessary by some undertakings. Negotiations are in progress for the erection of new plant with a capacity of 2,000,000 cu.ft. per day, with ancillary plant capable of dealing with 4,500,000 cu.ft. per day. As, even when approval has been received from the Ministry of Fuel and Power, it will be two-and-a-half years before this plant can be put into operation, the Gas Committee is considering the installation of additional emergency plant which will probably be available for the winter of 1948-49. A tender has been accepted, subject to the Ministry's approval, for rebuilding the two gasholders wrecked by enemy action in May, 1941. New purifiers designed to deal with 5,000,000 cu.ft. of gas per day are to be put into operation next month. Work has begun in laying a new 15 in. main from Trent Bridge to Ruddington, which will improve the supplies to West Bridgford, Edwalton, Tellerton, Plumtree, Keyworth and Ruddington. Coal stocks are materially lower than last year and the coal position generally is causing anxiety. The average price of coal per ton delivered to the gas-works is now 42s. 4d. per ton, compared with 20s. 7d. in 1939.

Oldbury Gas Department.—Accounts for the year ended Mar. 31 show the quantity of gas sold at 612,726,000 cu.ft., as against 606,650,000 cu.ft. during the previous year. The gross profit was £28,560, as against £29,173, and the net profit £2,692, as against £8,540 during the previous year. The average cost of coal shows an increase of 6s. 2d. per ton over the previous year.

Plymouth Gas Department.—There was a gross surplus on the municipal gas undertaking for the past year of £37,127, and after meeting loan charges the net surplus was £6,834. The Gas Committee has congratulated Mr. F. Blackburn, Engineer and General Manager, and the staff upon the improvement in the annual accounts. The undertaking was one of the most heavily blitzed in the country, but now shows a satisfactory position and is again on a sound basis.

United Kingdom Gas Corporation.—Net revenue for the year ended Dec. 31, 1945, after providing for income tax, interest, and other expenses, amounted to £137,470, against £111,263 for the previous year. A final Ordinary dividend of 3½% makes a total of 6% for the year, and leaves £16,915 to be carried forward against £15,589 from the previous year, when the total distribution was 5%. Total sales of gas by the constituent companies showed an increase of 5.76% over the previous year. The ordinary general meeting was held on July 2, and an extraordinary general meeting has been called for July 16, when a resolution will be submitted to convert the issued Preference shares of all three classes and the issued Ordinary shares into stock, which will be transferable in units of £1. A special resolution will also be proposed to alter the Memorandum of Association of the Company so as to extend its objects to those of an investment trust company, with power to invest in shares and securities of all kinds, instead of the present limited range of investments in public utility undertakings, and so as to give the Corporation powers to undertake consulting and other engineering work and to finance and assist technically and otherwise companies in which it is interested.

Company News

Keith Blackman, Ltd.—A profit of £88,689, compared with £135,684 for the previous year, is shown in the profit and loss account for the year ended Mar. 31, the amount of business done having been below that of 1944-45, due to the cessation of hostilities. At the annual meeting on June 27 an Ordinary dividend of 20% was declared, leaving £45,370 to be carried forward, against £45,181 brought in. In his statement issued with the report, Mr. M. Burningham, Chairman and Managing Director, said that industrial problems last year were of an exceptionally complex nature, in some respects even more harassing than in the actual war years. In common with manufacturers throughout the country they had found it impossible to secure an adequate supply of suitable labour to deal with the large volume of orders placed. There had also been considerable difficulty in securing reasonable deliveries of raw materials. After a universal upheaval such as had been experienced, it was not surprising that it was taking an appreciable time for nations to settle down. Nevertheless the Directors looked forward hopefully to a period when trading conditions would adjust themselves on a more stabilized foundation and the Company be in a position, by reason of being able to secure the requisite labour and material, to satisfy the increasing demands for its products at home and abroad.

Parkinson & Cowan, Ltd.—The report and accounts for the year ended Dec. 31, 1945, presented at the annual meeting on June 25, record a profit of £24,171, against £41,962, the decrease being due to a reduction in dividends from trading subsidiaries. An Ordinary dividend of 2½% was declared, compared with 5% for the previous year. Lieut.-Colonel H. W. Woodall, Chairman, in his statement issued with the report, said they had gone a long way towards completing their reconversion and production was rising steadily, but they remained impeded by delays in rebuilding blitzed factory space in London and Birmingham. Colonel Woodall is retiring from the position of Managing Director, but continuing as Chairman, and Mr. H. P. Parker, Deputy Managing Director, has become Managing Director. Mr. W. W. Parkinson, Deputy-Chairman, is retiring after 57 years' service, and Sir Harold Snagge has also decided to resign his Directorship. For the time being it is not proposed to fill the two vacancies thus created.

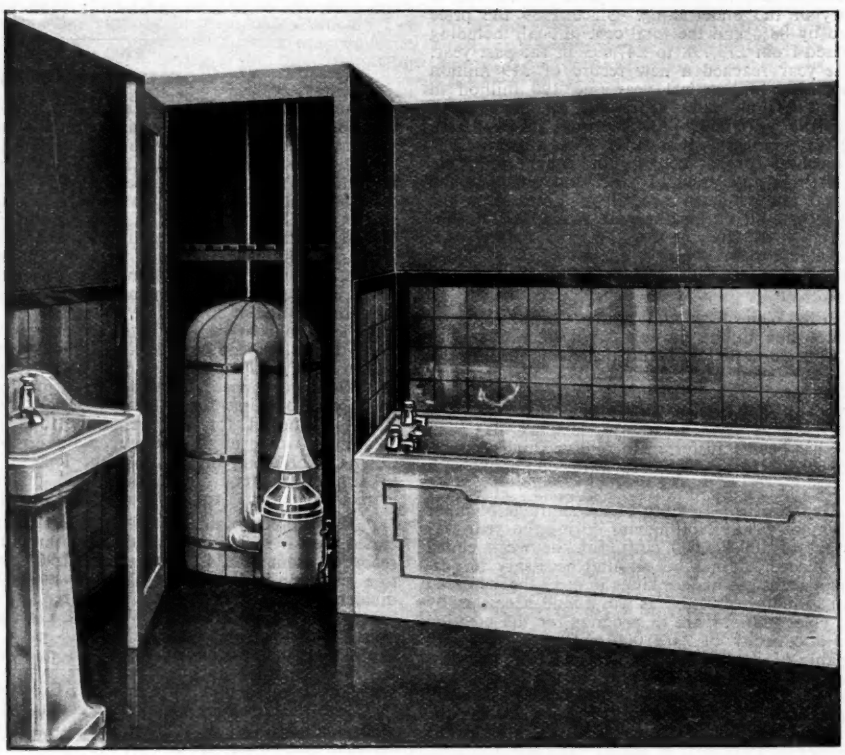
Owing to Increased Cost of material and labour, Morris Commercial Cars, Ltd., announce that they have been obliged to adjust the prices of their vehicles. A revised list of prices has been issued for the entire range of commercial vehicles, from the 15-20 cwt. van to the five-ton lorry, including tractor units.

The Price of Gas at Glasgow is likely to be increased by 3d. per 1,000 cu.ft. to domestic consumers, in the autumn. At present it costs 3s. 10d. per 1,000 cu.ft., as compared with 3s. pre-war. This was mentioned at a meeting of the Corporation Gas Committee by the Convenor, Councillor William Elger. Due to higher wages and dearer coal it has been disclosed that the Gas Department incurred a deficit of £43,689 during the past year.

The Address of the Organizing Committee of the National Coal Board is now Lansdowne House, Berkeley Square, London, W.1. (Telephone Grosvenor 4070.) This will for a time be the address of the National Coal Board when it is constituted. Communications to the Acting Secretary of the Organizing Committee about the vacancies on the staff of the National Coal Board already advertised should continue to be addressed to the Ministry of Fuel and Power, 7, Millbank, S.W.1.

The Horstmann Gear Co., Ltd., Bath, has introduced a five-day working week. The Directors feel that by offering shorter hours, together with good working conditions, more workers of the best type will be attracted and that present operatives will be able to display the high standard of workmanship which the strain of present day conditions makes it difficult to maintain. With the introduction of the 40-hour week they hope to increase production and afford a more efficient service.

All Houses require constant hot water



To be an asset in the modern home the Circulator must be an appliance which is neat and compact in design yet capable of supplying hot water cheaply and operating automatically, economically and safely.

In designing the "Meteor" Circulator these points have been fully considered and the time spent in experimenting and testing all the components of this heating unit under all circumstances has resulted in the production of a highly satisfactory appliance.

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COMPANY MEETING

United Kingdom Gas Corporation

THE Annual General Meeting of the United Kingdom Gas Corporation was held in London on July 2. Mr. BRUCE OTTLEY, the Chairman, who presided, said :

The net revenue for the year, after providing for income tax, interest and other expenses, amounts to £137,470, a figure which compares with £111,263 for the previous year. Out of the above figure of £137,470 dividends on the Preference shares have been provided, and an interim dividend of 2½% on the Ordinary shares has been paid. The sum of £28,560 has been applied to writing off a similar figure which figured in our accounts for expenses for increase of capital, &c. Our overdraft with our Bankers appears at £540,000, as against £508,000 in last year's accounts. This is occasioned by the ordinary development of the Corporation's business.

The increase in net revenue of some £26,000 is in no sense fortuitous. It is the result of the policy pursued consistently by your Board since the inception of the Corporation, whereby earnings of the constituent Companies were utilized on a considerable scale for the improvement and re-organization of their services in the certain knowledge that only by long term planning and "thinking ahead" can gas charges be reduced, business be expanded, consumers satisfied, and the shareholders' investment improved and strengthened. But, alas, the incentive to long-term planning of this nature has been removed from us by the unequivocally expressed intention of the Government to nationalize our properties. Moreover, we are placed in a difficult situation by the delays and restrictions on development consequent upon and arising from the pronouncement of nationalization.

Development Plans Upset by Nationalization Plans

During the war period we proceeded with extensive plans for post-war development to meet industrial and domestic demands for gas now arising. These are either shelved, suspended or seriously delayed by the action of the Government. As an example, we had planned in collaboration with an important colliery company owning collieries in Yorkshire adjacent to our West Yorkshire Gas Distribution Company a new battery of up-to-date coke ovens specifically to produce gas and domestic smokeless fuel at the pit head. The gas is urgently required by industry and to meet the demands of thousands of new houses in course of erection in this area. If nationalization had not intervened, the carrying out of this scheme would have been well advanced, and supplies from the new source would have been available by 1948 at the latest, whereas there is now little chance of supplies to meet these urgent requirements being made available before 1950.

The result is that as I forecast in my speech a year ago there are many factories and new houses which are or will be requiring gas supplies which cannot be made available until new works are constructed and in operation. I mention this as it is important that the British public should realize in due course who is responsible for the delay.

Capital Increase Proposed

In the meantime, to meet such development as has been approved by the Ministry of Fuel and Power and generally to consolidate the financial structure of the Corporation, your Directors are faced with the necessity of raising further capital, and are now engaged in the consideration of how best this can be done with security and without prejudice to the interests of our existing shareholders. We have also thought it wise to seek the authority of the shareholders to extend the provisions of the Memorandum of Association of our Corporation by enabling us to carry on the business of an Investment Trust Company in all its branches. I cannot say that there is any specific plan in the mind of your Directors at the present time. But we feel that, whilst the future of our Corporation is and must remain somewhat obscure, the possession of these powers might enable the Corporation to take a share in the future development of the Gas Industry and other cognate activities and find work for our central administration which the genius of Colonel Carr and his band of picked technicians have gradually built up in the ten years of the Corporation's existence. The conversion of our shares into stock is a very usual procedure, and is only dictated by reasons of convenience and economy.

Shareholders will, I hope, agree that the picture we are able to put before you to-day is a satisfactory one. The policy we have pursued from the outset, of improving and consolidating our properties and concentrating upon the provision of the best and cheapest service to our consumers, even at the sacrifice of dividends and immediate profits has amply proved itself. What is in store for the Industry remains a sealed book, save that the Minister of Fuel and Power has reiterated the Government's intention to nationalize our properties. No evidence has so far been advanced to indicate that nationalization will provide a cheaper and better service to the public; on the contrary, it is certain that it must inevitably result in higher over-riding administrative costs, and, moreover, the greatest safeguard of the public, the healthy competition which has existed as between coal, gas, electricity and oil, will be lost in one great national monopoly under the control of one Minister.

Expanded Sales of Gas

The gas sales of the Corporation's subsidiaries since their acquisition, excluding the newly-developed West Yorkshire Gas Distribution Company, which sells gas to other gas undertakings only, and the recently amalgamated Caledonian Gas Corporation, have been increased from 6,907 to 11,649 million cu.ft. per annum, and the capital has been reduced from £790 to £590 per million cu.ft. The total gas sold by the subsidiaries of the Corporation, including the West Yorkshire Gas Distribution Company, and the Caledonian Group, in the year 1945 was 15,380 million cu.ft. In order to achieve the results I have indicated where reconstruction has been required, we have not hesitated, as already stated, to sacrifice the dividends of our subsidiary undertakings.

Our policy has enabled us to keep down the price of gas, and in some areas, to cheapen it as, for example, in our West Riding Group of Gas Companies, the average price received for all gas sold in 1945 was 5.5d. per therm, as compared with 10.4d. per therm in 1937. This record is the result of what I would term the "public" enterprise of well-directed statutory controlled undertakings which I submit cannot be surpassed or indeed equalled by any scheme resulting from nationalization.

We are prepared to spare no efforts in the improvement and extension of our services, but it is our paramount duty to see that the interests of our shareholders, and gas consumers, are protected and to try and ensure that our undertakings are valued on a fair basis, and that due consideration is given to the financial sacrifices which have been made.

The report and accounts were adopted.

Windfall for Nottingham

Nottingham City Council last week agreed to make a reduction in the price of gas by increasing the present rebate of 2d. in the shilling to all prepayment consumers to 3d. in the shilling. The Council also adopted a proposal, contained in the Gas Committee's annual report, that £200,000, additional to the customary contribution, should be transferred for rate relief.

Ald. J. S. Griffin, Chairman, said his Committee were not in favour of maintaining big and in some cases frozen reserves. They received a windfall in the shape of a rebate of income tax going back four years and they were not making provision for any reserve of income tax (whereas £61,000 was provided last year), but proposed to revert to a former practice of providing for income tax as it became payable on the year of account. In addition, they had not considered it necessary to continue making provision for future expenditure such as repairs.

Ald. S. C. Armitage gave a warning of a heavy rise in the price of gas. A national balance sheet would hit Nottingham very hard, he said, and this was inevitable if the Government went on with "this nationalization business." It was deplorable to think that "this beautiful undertaking" should have to be dissipated in this way.

Coun. G. Swells moved the reference back of the report and that the Committee be instructed to report proposals for the disbursement of the £200,000 surplus to the gas consumers by way of reduction in charges, but there was no seconder, although Ald. W. Halls thought that the handing of such a large sum to the rates was all wrong from a moral point of view. It should be given back to the consumer. Nottingham supplied gas to a number of outside areas, and they were not going to get anything back.

Mr. Arthur Horner, President of the South Wales area of the National Union of Mineworkers, speaking at Cardiff recently, stated that there were 3,400 miners in Wales aged over 70, and 8,000 between 65 and 70, while only about half of them were under 55.

The House-Building Industries' Standing Committee has published a booklet of interest to all concerned with the planning, construction, and use of houses. In its endeavour to provide labour-saving houses which are designed to provide more living space and with superior plumbing and equipment, the Committee have recently organized a nation-wide contest for builders and architects. Demonstration pairs of houses, all of the same dimensions, are now being built, each embracing a different method of construction. These houses are described in the greatest detail and illustrated by scale plans in the booklet *Your New Home*. Here the reader has at hand every aspect of modern design and can study the various details of construction, planning, fitments, and services with armchair comfort. The publication is attractively produced and costs 2s. 9d., post free, from 82, New Cavendish Street, W.1.